

artificially charged during wet processing to provide an effective field intensity and a negative voltage of at least 2 volts sufficient to facilitate removal of harmful sub 0.05-micron particulates bonded to the wafer surface. --

3 -- ~~19.~~ (Amended) A process according to claim 18 wherein particulate contaminants are removed and substantially eliminated from a wafer by charging the wafer with a negative voltage of from about 2 to about 60 volts while providing a field intensity of at least 0.02 volts/mm at the wafer surface sufficient to dislodge, remove and repel substantially all of the harmful sub 0.1-micron particulates. --

2 -- ~~19.~~ (Amended) A process according to claim 18 wherein the front face of the process wafer is subjected to wet CMP polishing and is thereafter subjected to chemical cleaning and DI rinsing operations while said front face is negatively charged to a voltage sufficient to cause substantially complete removal of sub 0.05-micron contaminant particles bonded to the wafer surface. --

-- 20. (Amended) A process according to claim 18 wherein the front face of each wafer is subjected to wet CMP polishing and is thereafter subjected to a wet cleaning operation for 0.5 to 5 minutes while said front face is negatively charged to a limited voltage of 10 to 40 volts or more sufficient to cause substantially complete removal of sub 0.05-micron killer particles, the voltage and rate of charge of the wafer surface being applied or controlled during said wet cleaning operation in

such manner as to minimize or limit damage or alteration of the delicate microcircuitry. --

11 -- 21. (Amended) A process according to claim 18 wherein particulate contaminants are removed and substantially eliminated from a wafer by providing the front face of the wafer with a limited electric charge during wet processing steps insufficient to degrade the microcircuits, the charge being sufficient to provide a field intensity at said front face effective to dislodge and remove sub 0.05-micron particulates bonded at the wafer surface. --

-- 25. (Amended) A process according to claim 18 wherein the front face of the wafer is charged to a field intensity of at least 0.02 volts/mm during washing of the wafer in a highly dilute alkaline solution. --

4 -- 28. (Amended) A process according to claim 18 wherein said front face is provided with a limited electric charge of at least 10 volts during most of said wet cleaning operations to minimize particulate contamination. --

10 -- 29. (Amended) In the manufacture of advanced microchips from flat semiconductor wafers having delicate microcircuits formed on one face, an RCA-type wet cleaning process wherein a single wafer is treated in an aqueous alkaline solution containing hydrogen peroxide and thereafter treated in an acidic solution, rinsed in pure water and dried, characterized in that the wafer surface containing said delicate microcircuits is electrically charged during the wet cleaning

process to cause effective removal of sub 0.05-micron killer particles that are bonded to the wafer face. --

5 -- ~~31.~~ (Amended) A process according to claim 18 wherein a row of 10 or more silicon wafers is supported in a vessel or wafer carrier during the cleaning operations, the front face of each wafer being charged to a limited negative voltage, such as 2 to 60 volts, insufficient to harm the delicate microcircuits formed on that face and having a field intensity of at least 0.02 volts/mm sufficient to cause efficient removal of harmful sub 0.05-micron particulates. --

Cancel claim 14 and rewrite in independent form as follows:

12 -- ~~34.~~ (New) In the fabrication of microelectronic devices on silicon semiconductor wafers where delicate microcircuits are formed on the front face of a flat silicon wafer having a diameter of at least 200 mm by more than 200 steps including many layering, patterning and doping operations and at least 30 wet processing steps, the improvement wherein each semiconductor wafer is electrically charged from a direct current source to a voltage of from about 2 to about 60 volts during wet processing operations to provide an effective field intensity and wherein the front face of one thin plate or wafer containing the delicate microelectronic devices is subjected to a series of wet cleaning steps while that plate is mounted in a fixed position in the internal cavity of a flattened quartz glass receptacle. --

Cancel claims 1-6, 15-17, 22-24, 26, 27 and 30.